

Background

Delineation of target volumes and organs at risk are critical processes in a safe, effective radiotherapy pathway.

The RCR published national guidelines on radiotherapy peer review in 2022¹.

Factors including time pressures and technology issues make the guidance challenging to fully implement.

The NUH Lung Oncology Team comprises 6 clinical oncology consultants, one radiotherapy advanced practitioner and trainees, working across two sites.

A weekly peer review meeting was well-established, but no form was used. Software in use: Raystation, Mosaic, Casper, MVision.

Baseline Audit

Our baseline audit of 46 primary lung cancer patients receiving radical radiotherapy at NUH October-December 2024 demonstrated noncompliance with most recommended standards.

QI Project Aims

To improve from baseline to $\geq 95\%$ (proportion ≥ 0.95), over 5 months, primary lung cancer patients receiving radical radiotherapy with documented prospective peer review of radiotherapy contours, meeting 11 standards derived from RCR guidance (see table).

Methods

3 Plan-Do-Study-Act cycles (from the Model for Improvement) were completed.

An Ishikawa Fishbone Diagram helped generate improvement ideas. The whole peer review pathway was examined. The project involved clinicians, planning/dosimetry team, radiotherapy physics and radiotherapy management team.

Outcome Measures

1. For every patient, compliance (yes/no) with 11 standards was measured. Patients were grouped by week of starting radiotherapy.

2. Each week, proportions of patients (between 0-1) meeting each standard were calculated.

At the end of each PDSA cycle:

3. A median proportion of patients achieving each standard was calculated.

Data were processed using run charts in Microsoft Excel.

Peer review in the weekly meeting or 'ad hoc' between meetings was measured against the same standards.

Balancing Measures

To measure unintended lengthening of the pathway, time from planning CT to peer review and to first fraction were measured for every patient. Median, mean and range for these measures were calculated at baseline and across all cycles.

Interventions over 3 PDSA Cycles

Jan-Mar 2025: A new single-page electronic peer review record mirroring the RCR minimum dataset was designed in Mosaic and approved for use via governance processes.

Cycle 1 (8 weeks): voluntary use of the form was introduced. All affected professional groups were informed.

Cycle 2 (4 weeks): further education/awareness training for all team members, using cycle 1 results.

The form was re-designed at the end of cycle 2 to troubleshoot issues arising in cycles 1-2.

Cycle 3 (6 weeks): v2 of the form trialed. A new SOP for peer review was written with input from all stakeholders.



Results

56 patients were studied over 3 PDSA cycles over 5 months.



Weekly numbers: range 0-6 patients, mean 3.

Improvements were achieved across all standards by cycle 3.

$\geq 95\%$ (proportion ≥ 0.95) compliance was achieved in 9/11 standards.

No deterioration was observed in balancing measures.

The table below summarises the results.

Key to compliance levels: 0-0.79 0.8-0.94 0.95-1

Standard	Proportion of patients meeting standard:				
	Baseline	End of Cycle 1	End of Cycle 2	End of Cycle 3	Target
An electronic record of radiotherapy contour peer review is present	0.705	1	1	1	0.95
A standardised template document is used	0	0.8	1	1	0.95
Target volumes are documented as peer reviewed	0.415	0.85	1	1	0.95
Changes to target volumes are clearly documented	0.25	0.8	1	1	0.95
Organs at risk are documented as peer reviewed	0	0.5	0.5	0.63	0.95
Changes to organs at risk are clearly documented	0	0.4	0.5	0.63	0.95
Diagnosis is documented	0	0.8	1	1	0.95
Dose and fractionation are documented as reviewed	0	0.5	0.75	1	0.95
Clinicians present are documented	0.66	1	1	1	0.95
Treatment intent is documented as reviewed	0	0.4	0.75	1	0.95
Evidence that at least two clinicians participated	0	0	0.375	1	0.95

Run Charts

Run Charts were created for all standards, for example:



Discussion

QI methodology has been used to successfully introduce a pragmatic electronic record of peer review in the lung oncology team. Existing good practice is now captured in the patient record. The form also acts a checklist, to improve practice.

Improvement has been demonstrated in eleven standards derived from RCR guidance. Level of detail of OAR peer review remains the most debated topic.

The project not only improved documentation but examined the whole peer review pathway and communication between different professional groups. We now have our first departmental SOP on peer review.

To widen the impact of this project, we will now provide other oncology teams at NUH with our SOP, audit template and the peer review form. It is important that peer review practices are reviewed/embedded on a team level, as every team is different. We will re-audit practice in the lung team in 2026.